the water's edge on both sides, where it is visible from the railroad at least, it is bordered by a thin fringe of small cypress trees (*Taxodium distichum*).

Observations on this tree in all the southeastern states and in fourteen different years have led me to believe that it is rarely or never found on the banks of rivers or other bodies of water which have an average seasonal fluctuation of more than ten or twelve feet. Its trunk usually emerges from the ground just about low-water mark, and its enlarged base and "knees" are generally believed to reach up approximately to the average level of high water;[1] the figures just mentioned being about the maximum height recorded for these excrescences. Now the Mississippi River in the latitude of Lake Chicot has a seasonal fluctuation of about forty feet, and the cypress is absent from its immediate banks, though visible from the river in some places where it grows in nearby sloughs not directly connected with the main channel.

Presumably, therefore, when the waters of the Mississippi flowed through what is now Lake Chicot the cypresses which fringe the lake to-day did not exist. When the lake was cut off from the river, in the manner described in all treatises on potamology, its seasonal fluctuations were of course at once greatly reduced, and conditions then became suitable for the growth of the cypress on its banks. Consequently if one could determine the age of the oldest of these trees, by counting the annual rings or otherwise, that would give a minimum estimate of the age of the lake. As I have seen this lake only from the train, I have no data about the annual rings of its cypresses, but there is some evidence of another sort that they are comparatively young for that species.

Young cypress trees, of either species, are spindle-shaped in outline, much like the typical conventional conifers of the cooler parts of the northern hemisphere, while mature individuals are always more or less flat-topped, a character by which they can often be distinguished from other trees at a distance of several miles.[2] At just what age *Taxodium distichum* reaches its maximum height and begins to develop a flat top has not been determined, but very likely it is between 100 and 300 years.[3] The cypresses of Lake Chicot are mainly spindle-shaped, and perhaps date back only to the eighteenth century.

This supposition could easily be tested by a visit to the place in question with suitable tools. At the same time the cypresses bordering other ox-bow lakes along the Mississippi, especially those lakes whose age is a matter of historical record, should be examined from the same point of view. Additional evidence might be gathered from other swamp trees, especially the tupelo gum, *Nyssa uniflora,* which is common in sloughs and rare or absent on river-banks, bearing about the same relation to seasonal fluctuations of water that *Taxodium distichum* does. But the cypress is best for this purpose, on account of its longevity.

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[1] See *Bull. Torrey Bot. Club,* 32: p. 108, 1905.

[2] Hilgard ("Soils," 507–508, 1906), Cowles ("Ecology," 734, 1911), and some other writers have noted that the cypress when growing in uplands, such as parks, is spindle-shaped (see illustration in *Rep. Mo. Bot. Gard.,* 15: pl. 16, 1904), and have tried to correlate shape with habitat. C. S. Chapman (U. S. Bureau of Forestry, Bull. 56: 41–42, 1906) ascribes the flat top of cypress in Berkeley County, South Carolina, to the disease known as "peckiness," while Cowles, in the work cited, considers the flat-topped trees dwarfed on account of "the imperfect absorption which is characteristic of swamps." But age alone would seem to be a sufficient explanation of the difference in shape, since there is no doubt that all the younger trees, whether in their native swamps or in parks, are spindle-shaped, and the largest individuals known are flat-topped.

[3] The species has been known to civilized man only about 300 years, and presumably none of the existing cultivated specimens are old enough yet to have lost their juvenile form.

ON COMPARING AMMONIFYING COEFFICIENTS OF DIFFERENT SOILS

IN a recent publication[1] Professor W. G. Sackett gives some interesting results of a

study of the ammonifying powers of some Colorado soils, among them some of the now well known "niter soils" and some of the normal soils of the state. In concluding the discussion the author attempts a comparison of the ammonifying powers of soils from different states with his own, in which he quotes data on the subject obtained by J. G. Lipman as regards New Jersey soils, F. L. Stevens and coworkers as regards North Carolina soils and the writer as regards a California soil. From the comparison Sackett concludes that the niter soils of Colorado show a much higher ammonifying efficiency than soils from other states and than the normal soils of Colorado.

Despite the fact that Professor Sackett makes some qualifying statements in discussing the comparisons, he does not seem to attach importance enough to some factors of which he appears to be fully cognizant, and gives no consideration to other very important factors. The writer of this note fails to appreciate the value of a comparison of the ammonifying powers of various soils as obtained by different investigators whose methods vary as much as ours do to-day. Not only is it true, as Professor Sackett points out, that the time of incubation may be responsible for *some* of the differences found between his normal sandy loam and the one with which I worked, but differences of great magnitude can easily be obtained in changing the length of the incubation period, as J. G. Lipman has repeatedly shown in his long series of investigations on ammonification at the New Jersey Experiment Station. Moreover, the writer has found different brands of dried blood to vary so much in composition, both physically and chemically, that no fair comparison can be made without employing not only the same period of incubation and the same temperature for all soils but also the same kind of dried blood.

Other important factors also militate against a useful comparison of the ammonifying powers of different soils as obtained in laboratories varying widely in their methods of studying such problems. For example, Professor Sackett sterilizes his soils with mercuric chloride and then rinses them with sterile distilled water prior to inoculation with a *soil infusion*. In my laboratory soils are used directly for cultures without the use of a soil infusion. Others may use either procedure or both. I fail to see how one can safely compare the flora of a soil in its natural condition with a partial flora introduced through a soil infusion. The act of sterilizing a soil has been amply shown to be favorable to nitrogen transformation, but if in addition to that the soil is rinsed with water, it is obvious that the culture medium may become an entirely different one and yield a different ammonification coefficient from the same soil unsterilized or unrinsed. A soil infusion equivalent to 5 grams of soil may give a very far different bacterial development, possessed of very far different powers from the whole flora of 100 grams of soil. It must also be added here that the comparison of only a few soils can not be invested with much importance even if the soils are described by similar names. It is of course obvious that sandy loams may embrace soils of very widely differing natures and that no just comparison can be made between a sandy loam so called in one district with a sandy loam so called in another district.

As to the ammonification coefficients of niter soils as compared with those of normal soils the writer begs to add that he has on several occasions noted a high ammonifying power in soils of this state containing abnormal amounts of nitrate and has attributed that not only to a partial denitrification of the nitrate but also to an enormously increased development of putrefactive organisms in these soils which always produced large amounts of ammonia. I have also noted the same thing on two niter soils derived from the vicinity of Grand Junction, Colorado.

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[1] Bull. No. 184, Colorado Experiment Station, Part 1, June, 1912.